

GARBAGE CONTAINER FOR A SWEEPER

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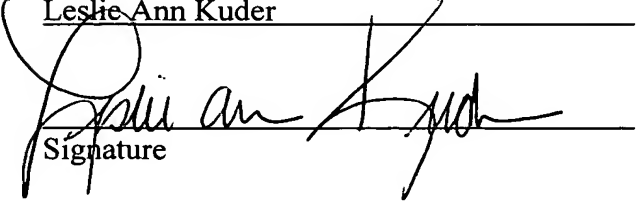
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GARBAGE CONTAINER FOR A SWEEPER

FIELD OF THE INVENTION

[0001] The present invention relates in general to sweepers for sweeping walkways, and in particular, an emptying device for a garbage container of a sweeper.

BACKGROUND OF THE INVENTION

[0002] Sweepers such as the type described in U.S. Patent No. 6, 041,471 are useful for collecting garbage that accumulates on city streets and sidewalks. Sweepers typically collect garbage by using brushes that contact a road or sidewalk surface and a suction device that vacuums the garbage into a garbage container. The garbage container is housed inside the sweeper and is hidden from view so that the sweeper maintains an attractive outward appearance.

[0003] Once the sweeper has collected the garbage, an operator must empty the garbage container. This is a tedious task that involves the operator bending over the garbage container, lifting the garbage bag out of the container and depositing the garbage bag in a receptacle. The garbage bags tend to be quite heavy and therefore may generate a strain on the operator's back. The emptying task further poses a health risk due to the nature of the collected garbage and the presence of dust. An improved sweeper for easier emptying of the collected garbage and that would reduce the health risk to the operator is therefore desirable.

SUMMARY OF THE INVENTION

[0004] According to an aspect of the present invention there is provided a sweeper including:

- a sweeper body mounted on at least one pair of wheels;

- at least one brush coupled to a forward end of the sweeper body for sweeping garbage from a ground surface;

- a suction device coupled to the sweeper body, the suction device communicating with the forward end of the sweeper body;

- a garbage container assembly mounted inside the sweeper body, the garbage container assembly for receiving garbage drawn into the sweeper by the suction device;

- a basket movable into and out of the garbage container assembly;

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a lift mechanism coupled to an underside of the basket, the lift mechanism being movable between a retracted position and an extended position; and

wherein in the extended position, the basket is tiltable to dump garbage contained in the basket.

The present invention provides advantages in that operator safety is increased because the operator is not required to lift heavy garbage bags from inside the sweeper.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] An embodiment of the present invention will now be described more fully with reference to the accompanying drawings in which:

Figure 1 is a side view partly in section of a sweeper having a garbage container assembly of the present invention;

Figure 2 is an isometric view of the garbage container assembly of Figure 1;

Figure 3 is an exploded view of portions of the garbage container assembly of Figure 2;

Figure 4 is a view on A of the garbage container assembly of Figure 2 with a front wall structure removed and the garbage container assembly in a retracted position;

Figures 5 and 6 are views on A of the garbage container assembly of Figure 2 with a front wall structure removed and the garbage container assembly in a first partially extended position and a second partially extended position, respectively.

Figure 7 is a view on A of the garbage container assembly of Figure 2 with a front wall structure removed and the garbage container assembly in a fully extended position;

Figure 8 is a view on A of the garbage container assembly of Figure 3 with a front wall structure removed and the garbage container assembly in a dumping position;

Figure 9 is an enlarged isometric view of a scissor lift mechanism of Figure 3;

Figure 10 is an isometric view of portions of the scissor lift mechanism of Figure 9;

Figure 11 is an exploded view of Figure 10; and

Figure 12 is an exploded view a hydraulic actuating assembly for the scissor lift mechanism.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENT

[0006] Referring to Figure 1, a motorized sweeper is generally shown at 10. The sweeper 10 comprises a sweeper body 12 that is mounted on rear wheels 14 and front wheels (not shown). A pair of brushes (not shown) projects forward from the sweeper body 12 to direct garbage into a suction device 20. The suction device 20 draws dust and garbage into the top of a perforated basket 22, which is mounted in a garbage container assembly 24. An air-permeable bag 30 is held within the basket 24 for receiving the dust and garbage. The garbage container assembly 24 includes an open ended container 26 and a dust drawer 28 that is mounted below the garbage container 26. Suction is provided by an engine powered fan 32 that is located rearwardly of the suction device 20 and the garbage container assembly 24.

[0007] Referring now to Figure 2, the garbage container assembly 24 is mounted on a chassis 34 of the sweeper 10 (shown in Figure 1). As shown in Figure 2, the open ended container 26 includes a generally square shaped opening 36 for receiving the perforated basket 22. The perforated basket 22 is made from a suitable material such as aluminum, steel or plastic, for example. Preferably, the basket 22 is perforated on all sides and on the bottom.

[0008] Referring to Figure 3, the open ended container 26 includes four wall structures 38 that are secured to one another by four corner structures 40, which provide support thereto. In the present exemplary embodiment, the container 26 is made of a sheet metal, such as aluminum or steel, for example. The wall structures 38 are welded to the corner structures 40 or, alternatively, the wall structures 38 may be secured to the corner structures 40 by fasteners.

[0009] Each wall structure 38 includes an outer wall 44 having upper and lower surfaces, 46 and 48 (shown in Figure 4), respectively, extending inwardly therefrom. Upper and lower flanges 50 and 52 (shown in Figure 4), respectively, extend toward one another from the upper and lower surfaces 46, 48, respectively, of each outer wall 44 in a plane that is offset from the outer wall 44. Side flanges 54 extend from the corner structures 40 and lie in the same plane as the upper and lower flanges 50, 52.

[0010] Referring to Figures 4 to 8, filters 56 are coupled to the upper and lower flanges 50, 52 of each outer wall 44 and the side flanges 54 of the corner structures 40 by a seal 58. The filter 56 has been removed from a rear one 42 of the wall structures 38 for clarity, however, it will be appreciated that a filter 56 is provided adjacent each of the outer walls 44.

[0011] An air gap 60 is provided between the filters 56 and the outer walls 44 of the container 26. The corner structures 40 include air passages so that the air gap 60 is continuous about the container 26. The air gap 60 allows air to distribute all around the filters 56 such that air will continue to circulate around the filters 56 even in the event that a portion of the filters 56

is clogged with dirt and dust. The filters 56 are provided to remove particles that pass through the basket 22. In the present embodiment, the filter 56 is comprised of polyester and is sized to capture particles that are greater than approximately 2 microns in size. It will be appreciated that instead of individual filters 56 coupled to each wall structure 38, a single continuous filter may be provided in the container 26 to surround the basket 22.

[0012] A vent 62, which is best seen in Figure 6, is provided in the rear one 42 of the wall structures 38 to allow air to travel from the air gap 60 of the container 26 toward the fan 28 (shown in Figure 1), which is located outside of the container 26 adjacent the vent 62.

[0013] Referring to Figures 3 and 4, a scissor lift mechanism 70 is coupled between a reciprocating platform 72 on which the basket 22 is mounted and a base 74, which is secured to the chassis 34. The scissor lift mechanism 70 is housed in the dust drawer 28 of the garbage container assembly 24. As shown in Figure 9, the reciprocating platform 72 includes a generally flat frame 75 having clips 76 for coupling to the bottom surface of the basket 22.

[0014] Referring to Figures 8 and 9, a pair of struts 78 and 80 that are sized to extend generally across the interior of the container 26 support the reciprocating platform 72. Each strut 78, 80 includes a pair of generally horizontally extending slots 82 and 84 that are sized to receive opposing ends of first and second cross links 85 and 86, respectively. Second ends 88 of opposing pairs of first links 90 of the scissor lift mechanism 70 are pivotally coupled to the cross links 85, 86. An upper cross link 91 extends between opposing pairs of first links 90.

[0015] Second ends 92 of opposing pairs of second links 94 are pivotally coupled to first ends 96 of the first links 90 by cross links 98, as shown in Figures 10 and 11. Similarly, second ends 100 of opposing pairs of third links 102 are pivotally coupled to first ends 104 of the second links 94 by cross links 106. A lower cross link 95 extends between opposing pairs of second links 94. Second ends 108 of the third links 102 are secured to opposing plates 114 and 116, which are secured to the base 74 by fasteners (not shown), through flanges 118 by fasteners 119.

[0016] The scissor lift mechanism 70 includes a hydraulic actuating mechanism 120 to move the basket 22 from a retracted position, which is shown in Figure 4, to a fully extended position, which is shown in Figure 7. Referring to Figure 12, the hydraulic actuating mechanism 120 includes a piston 122 that is movable within a hydraulic cylinder 124.

[0017] A lug 126 is provided at the distal end of the piston 122. The lug 126 is coupled to a curved element 128 that abuts the lower cross link 95. Movement of the piston 122 causes the curved element to pivot about an axis of the cross link 95. An actuating link 130 extends between the hydraulic cylinder 124 and cross link 106. The actuating link 130 (shown in Figure 7) is pivotable about the cross link 106 and moves from the retracted position of Figure 4 to the fully extended position of Figure 7. Movement of the piston 122 causes the actuating link 130 to

pivot about the cross link 106, which causes the scissor lift mechanism 70 to raise or lower.

[0018] A dumping mechanism 140, which is best shown in Figures 7 and 8, is coupled to a lug 148 that extends from a lower surface of the frame 75 of the reciprocating platform 72. The dumping mechanism 140 includes first, second and third links, 142, 144 and 146, respectively. The dumping mechanism 140 maintains a connection between the scissor lift mechanism 70 and the basket 22 when the garbage contained in the basket 22 is being dumped.

[0019] In use, an operator opens an outer panel of the sweeper 10 to gain access to the sweeper 10. The operator then presses a button (not shown) that is located on the sweeper 10 to initiate movement of the scissor lift mechanism 70 to raise the basket 22.

[0020] During regular sweeper operation, the garbage container assembly 24 is in the retracted position of Figure 4. Pressing the button initiates extension of the piston 122 of the hydraulic actuating mechanism 120. This causes the scissor lift mechanism 70 to move from the retracted position to a first partially extended position, which is shown in Figure 5, and then to a second partially extended position, which is shown in Figure 6. It will be understood that in the present embodiment, the scissor lift mechanism 70 provides a linear displacement of the basket 22 with constant speed throughout travel. The scissor lift mechanism 70 continues upward movement toward the fully extended position of Figure 7. Once the scissor lift mechanism 70 has raised the basket 22 to a maximum height, the operator tilts the basket 22 out of the container 26 into the dumping position of Figure 8. Prior to tilting the basket 22, the operator closes and ties the air-permeable bag 30 or in the event that no bag is present in the basket 22, the operator places a bag around the basket 22 to receive the garbage. In the dumping position, the dumping mechanism 140 maintains a connection between the basket 22 and the container assembly 24 and permits the basket 22 to pivot. Thus, garbage falls out of the basket 22 for depositing into a garbage receptacle (not shown).

[0021] Once the garbage has been dumped from the basket 22, the operator returns the basket 22 to the position of Figure 7 and initiates downward movement of the scissor lift mechanism 70 by pressing a button. Once the basket 22 has reached the retracted position of Figure 4, the operator may return to using the sweeper 10 to collect garbage.

[0022] The many features and advantages of the invention are apparent from the detailed specification and, thus, it is intended by the appended claims to cover all such features and advantages of the invention that fall within the true spirit and scope of the invention. Further, since numerous modifications and changes may occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.